

## A revision of Devonian trilobites from Belgium – Part 2. The genera *Gerastos* and *Cornuproetus*

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### Abstract

Belgian Devonian trilobites have long been known, although they remain comparatively poorly documented. A revision of the obsolete nomenclature seems long overdue, and added to that, critical evaluations of listings of trilobite taxa by MAILLIEUX over sixty years ago are called for. The present note is the second part of a revision of Devonian trilobites from Belgium, and comprises data from locality ARD004 at Resteigne and locality ARD005 at Couvin (Ardennes, Belgium), which yielded the new material. It briefly discusses correlations of Middle Devonian (Eifelian) successions of the Ardennes and Eifel (Germany), and describes two taxa (*Gerastos dhondti* n. sp. and *Cornuproetus cornutus*) from Couvin and one taxon (*Gerastos prox*) from Resteigne.

**Keywords:** Trilobita, Devonian (Eifelian), Belgium.

### Résumé

La présence de trilobites dans le Dévonien belge est connue depuis longtemps, mais elles ont été relativement peu étudiées. Une révision de la nomenclature obsolète est nécessaire ainsi que l'évaluation critique des listes de MAILLIEUX qui datent d'il y a soixante ans. La présente note est la deuxième partie d'une révision des trilobites du Dévonien belge, et contient les données nouvelles des localités ARD004 à Resteigne et ARD005 à Couvin (Ardennes, Belgique). La corrélation du Dévonien Moyen (Eifélien) des Ardennes et de l'Eifel (Allemagne) est brièvement discutée et deux taxons (*Gerastos dhondti* n. sp. et *Cornuproetus cornutus*) en provenance de Couvin et un taxon (*Gerastos prox*) de Resteigne sont décrits.

**Mots-clefs:** Trilobita, Dévonien (Eifélien), Belgique.

### Introduction

As already mentioned by MAGREAN & VAN VIERSEN (2005), little work has been done on Devonian trilobites from Belgium. MAILLIEUX (1904, 1933, 1938) recorded a number of taxa, and his lists represent a fairly accurate view of current knowledge of Devonian trilobite faunas in Belgium. This note forms part of a series of renewed studies on trilobites from the Belgian Ardennes, in order to update the work done by MAILLIEUX and to enhance correlation with the Eifel region.

Between 1999 and 2006, the author conducted fieldwork in the Ardennes, in particular in the Dinant Synclinorium, and this has yielded new trilobite material of Early to Late Devonian age. When comparing the lists of Devonian trilobites provided by MAILLIEUX (1904, 1933, 1938) and the newly collected specimens, the need for an extensive (nomenclatural) review becomes obvious. Moreover, the new collections contain a number of taxa not previously recorded from the Ardennes.

### Location and stratigraphy

The abbreviation 'ARD', that is used here, stands for 'Ardennes Locality' and was assigned by the author to each site in combination with a number that corresponds to the sequence of visits to those sites.

ARD004: Temporary outcrop in a small area north of the Route de Petigny at Couvin (southern border of the Dinant Synclinorium) described and geographically positioned (700 m east of La Folie, Pl. Couvin 8015/11) by STRUVE (1985). The latter examined brachiopods from the MAILLIEUX – collection kept at the IRScNB and correlated ARD004 with a level within the Upper Eifelian, ranging from upper Junkerberg Formation to lower Ahbach Formation (see Table 1). MARION & BARCHY (1999)

Chronostratigraphie	Eifelkalkmulden	Ardennes (Southern border of the Synclinorium of Dinant)
Eifelian	Ahbach Fm.	Lower half of Hanonet Fm.
	Freilingen Fm.	?
	Junkerberg Fm.	Jemelle Fm.
	Ahrdorf Fm.	
	Nohn Fm.	
	Lauch Fm.	Upper part of Eau Noire Fm.

Table 1 — Correlations between Devonian successions of the Eifel and Ardennes (Southern border of the Synclinorium of Dinant).

mapped the Petigny outcrop area as part of the Jemelle Formation, which is of Eifelian (Middle Devonian) age.

ARD005: Western part of the first level of the La Lesse quarry at Resteigne (Tellin, southern border of the Dinant Synclinorium) described and geographically positioned by PREAT & TOURNEUR (in BULTYNCK et al., 1991). Exposed is the Hanonet Formation of Eifelian (Middle Devonian) age (Table 1).

During several fieldwork campaigns from 1999 to 2006, a rich trilobite fauna was discovered in the southern border of the Dinant Synclinorium by the author, including representatives of the trilobite orders Corynexochida (Scutelluinae), Phacopida (Asteropyginae, Phacopinae), Proetida (Proetinae, Otariioninae, Cornuproetinae, Tropicocoryphinae) and Lichida (Trochurinae, Odontopleurinae). As far as numbers of taxa are concerned, the majority of the material collected is assignable to the Phacopinae and Proetinae, both represented by several taxa. At sites ARD004 and ARD005 several parts of specimens and complete specimens with black exoskeletons in light grey limestone were collected.

### Systematic Palaeontology

In the descriptions the terms 'sag.' (sagittal) and 'tr.' (transverse) are used in reference to directions along the axial line of the body and at right angle to this line, respectively. Morphological terminology is based on WHITTINGTON *et al.* (1997). All specimens described herein are deposited at the Institut royal des Sciences naturelles de Belgique (Brussels, Belgium), abbreviated as 'IRScNB'. All specimens have been prepared, treated with ammonium chloride and photographed by Werner Kraus (RWTH Aachen University).

Order Proetida FORTEY & OWENS, 1975

Superfamily Proetoidea HAWLE & CORDA, 1847

Family Proetidae SALTER, 1864

Subfamily Cornuproetinae RICHTER, RICHTER & STRUVE, 1959

Genus and subgenus *Cornuproetus* RICHTER & RICHTER, 1919

*Type species: Gerastos cornutus* GOLDFUSS, 1843, by original designation of RICHTER & RICHTER (1919).

### *Cornuproetus (Cornuproetus) cornutus cornutus* (GOLDFUSS, 1843)

Pl. 1, Figs 1-4

1904 — *Proetus cornutus* — MAILLIEUX, p. 579.

2005 — *Cornuproetus (Cornuproetus) cornutus cornutus* — MAGREAN & VAN VIERSEN, p. 89, pl. 1, figs 1-7.

### Material

Articulated carapace with complete exoskeleton (IRSNB a12218) from locality ARD004 at Couvin, belonging to the Jemelle Formation.

### Description

MAGREAN & VAN VIERSEN (2005) gave a detailed description of an internal mould of an articulated carapace of *Cornuproetus (Cornuproetus) cornutus cornutus* (GOLDFUSS, 1843) from Jemelle. The newly discovered carapace at Couvin shows the complete exoskeleton in excellent condition.

### Comparison

MAILLIEUX (1904) reported "*Proetus*" *cornutus* (GOLDFUSS, 1843) from the Eifelian of the Couvin area and from the Eifelian of mainly the southern and eastern parts of the Dinant Synclinorium (MAILLIEUX, 1938). The author investigated specimen IRScNB IG 9694-7 from the Eifelian from Rochefort, identified as "*Proetus*" *cornutus* by Maillieux in 1937 and agreed with this assignment. This is the first record of *Cornuproetus (C.) c. cornutus* from levels coeval with the Junkerberg Formation in the southern part of the Dinant Synclinorium. The present subspecies may be distinguished from *Cornuproetus (C.) c. pruemensis* (BASSE, 2002) from the Freilingen Formation of the Eifel area, mainly by having a less convex anterior rim, and from *Cornuproetus (Diademaproetus) rhenanus* (BASSE, 2002) in having more ridges (4) on

the cephalic rim (normally two in *Cornuproetus* (*D.*) *rhenanus* as described in BASSE, 2002).

Subfamily Proetinae HAWLE & CORDA, 1847

Genus *Gerastos* GOLDFUSS, 1843

*Type species: Proetus cuvieri* STEININGER, 1831

***Gerastos dhondti* n. sp.**

Pl. 3, Figs 1-4

#### *Derivatio nominis*

This species is dedicated to Annie Dhondt (1942-2006), for many years Editor-in-Chief of the Bulletin de l'Institut royal des Sciences naturelles de Belgique, Sciences de la Terre, as token of our gratitude for her encouragement and assistance in producing our first publication on Belgian trilobites (MAGREAN & VAN VIERSEN, 2005).

#### *Locus typicus*

Location ARD004, Couvin, Belgium.

#### *Stratum typicum*

Jemelle Formation, Upper Eifelian (Middle Devonian).

#### *Holotype*

A single articulated exoskeleton (IRSNB a12220) from locality ARD004, Couvin, Jemelle Formation.

#### *Material*

Exoskeleta of two complete carapaces (IRSNB a12220-a12221) from locality ARD004, Couvin, Jemelle Formation.

#### *Diagnosis*

See LÜTKE (1990) and LIEBERMAN (1994). In addition to this:

Cephalon (lateral view): the glabella is laterally convex, overlapping the anterior border. Anterior border is inflated as a bulge. The ratio between the width and the length of the glabella is less than 0,7. The maximum width of the glabella in *G. dhondti* is less than 36 % of the width of the cephalon. Eye socle flat, eye small. The width of the eye socle is not equidistant: its posterior part is twice as wide as its anterior part. The genal angle is adaxially rounded.

Pygidium: semicircular in lateral view. The axial rings are flat, of low profile and not clearly distinguished; the pleural furrows are half as long as the axial rings and lie centered in the middle of the axial ring. The pleural furrows are of very low profile and

do not reach to the pygidial border. The terminal axial piece is straight laterally. The angle between the outline of both sides of the rhachis is greater than 30 degrees.

#### *Description*

There are several differences between *G. cuvieri* (STEININGER, 1831) and *G. dhondti* n. sp. The glabella of the latter has a much higher arch, the anterior border is more inflated as a bulge, and the eye is smaller and placed higher on the librigena. The glabella is narrower, that means that the transverse width (W) of the glabella relative to the cephalon width is less in *G. dhondti* (36 % of cephalon width) than in *G. cuvieri* (45% of cephalon width). The ratio between the width and the length of the glabella is less than 0,7 in *G. dhondti*, but more than 0,8 in *G. cuvieri*. The glabella in *G. dhondti* tapers less rapidly to the anterior than in *G. cuvieri*. The eye socle area is not equidistant in the former. The genal angle is more rounded than in *G. cuvieri*, which has a genal angle of about 90 degrees, and the axial rings of the pygidium are not bent laterally. The main differences with *G. prox* (RICHTER & RICHTER, 1956) are the lack of tubercles on the glabella and the eye socle.

#### *Discussion*

The exoskeletons of two complete carapaces were found during fieldwork at ARD004. The material is in very good condition. The carapace of *G. cuvieri* from Gees in Germany (Pl. 4, Figs 1-4), shows the typical characteristics of specimens from the Ahrdorf Formation of the Eifel region as described in LÜTKE (1990) and in RICHTER & RICHTER (1956), where the neotype is illustrated.

MAILLIEUX (1904) reported "*Proetus*" *laevigatus* (GOLDFUSS, 1843) and "*Proetus*" *granulosus* (GOLDFUSS, 1843) from the Eifelian of the Couvin area and from the Eifelian of mainly the southern and eastern parts of the Dinant Synclinorium (MAILLIEUX, 1938). The new material is the first record of *Gerastos* in the late Eifelian of the southern part of the Dinant Synclinorium in Belgium. BASSE (2002) states that RICHTER & RICHTER (1956) already assumed *Gerastos prox* to be the successor of *G. cuvieri*. He also states that the 'missing link' should come from the Junkerberg Formation, but only one pygidium of *G. cuvieri* had been reported in the Rhenohercynian (BASSE, 2002). Therefore, *Gerastos dhondti* can be regarded as being one of the missing links and also as being a member of the "*Gerastos cuvieri* group", as stated in LIEBERMAN (1994).

***Gerastos prox*** (RICHTER & RICHTER, 1956)

Pl. 2, Figs 1-3

- 1956 — *Gerastos prox* – RICHTER & RICHTER, pl. 3, fig. 17; pl. 4, figs 23-26, pl. 6, fig. 38.  
 2002 — *Gerastos prox prox* – BASSE, pl. 6, figs 110-112; pl. 7, figs 119-127.

**Material**

Exoskeleton of a disarticulated carapace (IRSNB a12219) from locality ARD005, Hanonet Formation (Eifelian – Givetian transition).

**Remarks**

One exoskeleton of a disarticulated carapace was found during fieldwork. It is in good condition. It shows the typical characteristics of the specimens from the Ahbach Formation (Eifelian-Givetian transition) of the Eifel region as described in RICHTER & RICHTER (1956). It is the first reported record of *Gerastos prox* from Eifelian strata of mainly the southern and eastern parts of the Dinant Synclinorium. In the Eifel, *G. prox* has been reported from the Freilingen Formation (Upper Eifelian) to the Ahbach Formation (Lower Givetian) (BASSE, 2002).

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**Explanation of the plates**

## PLATE 1

- Figs 1-4 — Exoskeleton of carapace of *Cornuproetus cornutus cornutus* (GOLDFUSS, 1843) (IRSNB a12218); location ARD004, Couvin (Belgium); Jemelle Fm., Middle Eifelian; 1: dorsal view, x 3; 2: dorsal view of cephalon, x 4.3; 3: dorsal view of pygidium, x 3; 4: lateral view, x 3.5.

## PLATE 2

- Figs 1-3 — Exoskeleton of disarticulated carapace of *Gerastos prox* (RICHTER & RICHTER, 1956) (IRSNB a12219); Resteigne; Hanonet Fm.; 1: dorsal view, x 6; 2: dorsal view of pygidium, x 5; 3: dorsal view of cephalon, x 3.5.

## PLATE 3

- Figs 1-4 — Exoskeleton of carapace of *Gerastos dhondti* n. sp.; Holotype (IRSNB a12220); Couvin; Jemelle Fm., Late Eifelian; 1: lateral view, x 5.5; 2: dorsal view, x 3.7; 3: dorsal view of pygidium, x 4; 4: dorsal view of cephalon, x 3.5.

## PLATE 4

- Figs 1-4 — Exoskeleton of carapace of *Gerastos cuvieri* (STEININGER, 1831) (IRSNB a12222); Gees (Germany); Ahrdorf Fm., Middle Eifelian; 1: lateral view, x 7.6; 2: dorsal view, x 5.5; 3: dorsal view of cephalon, x 5; 4: dorsal view of pygidium, x 6.9.



1



2



3



4



1



2



3

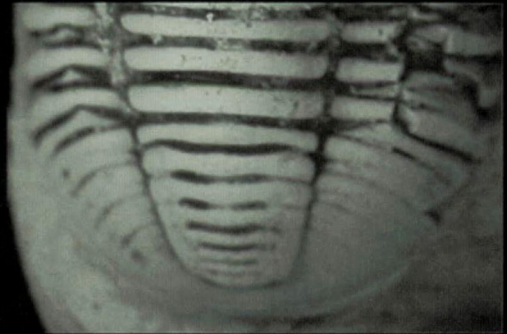




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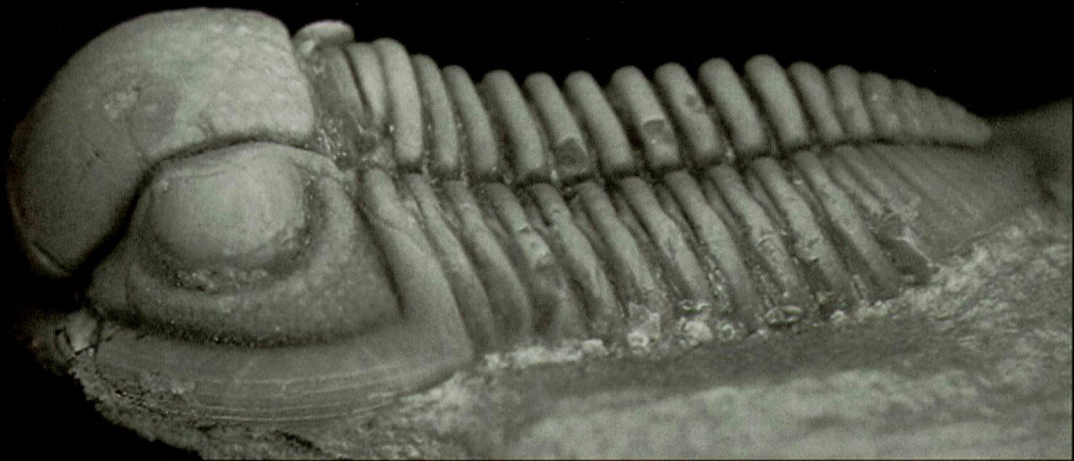
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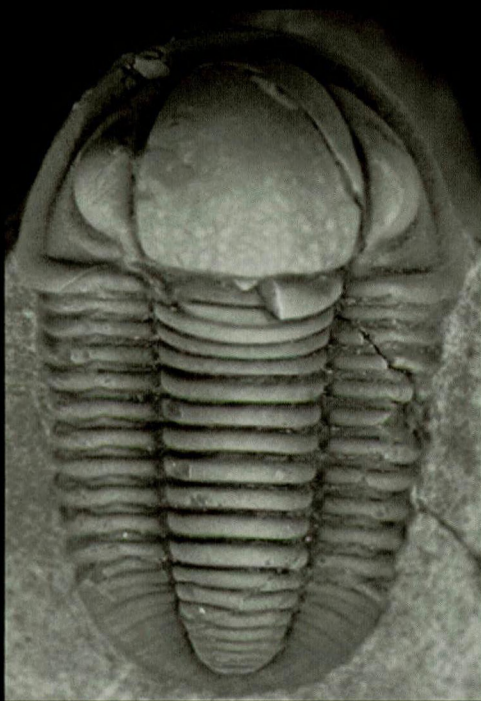
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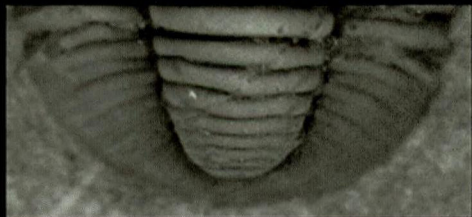
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